2 Comparing Fractions with Unlike Denominators

Goal **Compare fractions when the denominators are different.**

The 15 km Charity Walk-a-thon has

- a trail mix station every two thirds of a kilometre;
- a water station every three fourths of a kilometre; and
- a cooling station every three halves of a kilometre.

Ayan has reached the first water station, Mark is at the first cooling station, and Angele is at the second trail mix station.
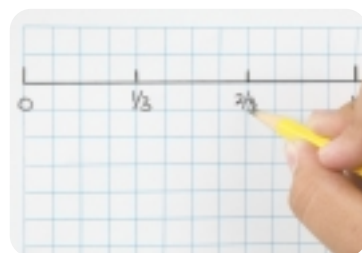
? **Who has walked the farthest?**

Raven's Solution

I'll make a sketch of the first 2 km of the race on grid paper and mark the stations. I need to show halves, thirds, and fourths, so I want a whole that I can easily divide by 2, 3, or 4. I think a whole with 12 sections will work. 1 km will be represented by 12 squares.

A third of 12 squares is 4 squares, so $\frac{1}{3}$ is 4 squares past 0 and $\frac{2}{3}$ is another 4 squares past $\frac{1}{3}$.

A. Draw a number line for 0 km to 2 km. Mark all of the thirds. Label the trail mix stations.

B. Mark the fractions for the cooling stations.

C. Mark the fractions for the water stations.

D. Mark the locations of the three students.

E. Who has walked the farthest?

Reflecting

1. How did you decide where to put the water and cooling stations?

2. Look at the positions of these fractions on the number line: $\frac{2}{2}$, $\frac{2}{3}$, and $\frac{2}{4}$. Which fraction is greatest? Why does that make sense?

3. How can you compare fractions when both the numerators and denominators are different? Use $\frac{3}{4}$ and $\frac{2}{3}$ as an example.

Checking

4. a) Write fractions for the locations of these stations:
   b) Order the fractions in Part a) from greatest to least.
   c) Explain the strategies you used to order the fractions.

   - T, the fourth trail mix station
   - W, the third water station
   - C, the third cooling station

Practising

5. Compare. Write $>$, $<$, or $=$. Explain your strategy.
   a) $\frac{5}{6} \blacksquare \frac{1}{6}$ b) $\frac{2}{4} \blacksquare \frac{2}{5}$ c) $1\frac{1}{2} \blacksquare \frac{3}{4}$ d) $\frac{5}{2} \blacksquare 3\frac{1}{2}$

6. For each pair of stations in the Charity Walk-a-thon, which is farther from the start of the race? How do you know?
   a) The second water station or the third trail mix station
   b) The third cooling station or the fourth water station
   c) The sixth trail mix station or the fourth cooling station

7. For each pair of chores, which one took longer to complete? Tell how you know.
   a) $\frac{4}{5}$ h doing laundry or $\frac{2}{5}$ h vacuuming
   b) $\frac{1}{3}$ h washing dishes or $\frac{1}{5}$ h drying dishes
   c) $\frac{1}{2}$ h collecting garbage or $\frac{3}{5}$ h cleaning the bathroom

8. Count by fourths from 0 to 4.

9. What is the greatest value you can use to make each true?
   a) $\frac{\blacksquare}{5} < \frac{3}{4}$ b) $3\frac{2}{3} < 3\frac{4}{\blacksquare}$ c) $4\frac{3}{8} > \blacksquare\frac{2}{3}$